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OF

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## *A List of the Birds of Cornwall.* By EDWARD HEARLE RODD, Esq.

(Continued from S. S. 2204).

*Sedge Warbler.*—Summer visitant; generally distributed; frequents wet ditches, willow plots, &c., and sings both in the day and night: when concealed in cover it is stationary, but when in open hedges continually moving about.

*Reed Warbler.*—Several captured at Scilly, with other summer migrants, in the autumn of 1849 (see woodchat shrike); not known as Cornish until then. Very rare in the western counties, and altogether as a British bird much more rare and local than the sedge warbler: distinguished from the sedge warbler by the absence of a line over the eye, and by the uniform brown colour of its back, without dark spots. Its song has a higher but rather weaker pitch than the sedge warbler. It has also a much greater variety, is more warbling, and more original with less imitative qualities than the sedge warbler, which latter bird seems perpetually to mock the songs of other birds in all its passages. The reed wren's song is a hurried but a decided warble, and is not unlike the low hurried warble of the whitethroat, when that bird sings without excitement, and mounting in the air. The reed wren's song, however, is chiding and grating, but in a less degree than that of the sedge warbler: the notes are not so forced or loud as in that bird, but sufficiently marked to denote its being one of the true aquatic warblers.

*Blackcap Warbler.* — Local; summer visitant. Occasionally observed in Gulval and Lariggan valleys, and at Trereife; in the eastern part of the county very generally distributed. Song sweet, wild, and full. As the summer advances the song is then less interrupted, louder, and far more remarkable for variety of expression; when continued thus unbroken the song is one of the most attractive of our smaller song birds. The blackcap is sometimes found in the winter months sparingly in the neighbourhood of Penzance; they have been observed in ivy against walls, the most favourable locality for insects and spiders, &c.

*Garden Warbler.*—Summer visitant: eastern parts of the county. One only recorded as seen about Penzance, although several specimens were obtained, along with other of our summer migrants, from Scilly, in the autumn of 1849. (See pied flycatcher, reed wren, &c.) This species breeds annually in the woods at Trebartha, in North-hill, from

BRITISH MUSEUM

whence specimens of its nest and eggs have been received. Its habits, food, song, nest and eggs, and general character, approach very near the former species:—song rather more hurried, and sometimes garrulous in expression, but the quality of voice quite equal, and the tones deeper, some of its notes resembling the blackbird's song: nest generally placed loosely in the middle of a bramble-bush, in a ditch, particularly where nettles offer concealment in the bush.

*Whitethroat.* — Summer visitant: commonly distributed. The inferiority of song in this species is very remarkable when its similarity and alliance to the two former are considered.

*Lesser Whitethroat.*—Occasionally seen in the autumn migration at Scilly, but unknown otherwise: summer visitant, common elsewhere.

*Wood Warbler.* — Summer visitant: very common in several localities in the eastern parts of the county; *viz.*, Trebartha woods, where it breeds annually: only once seen in the western district. This bird possesses two varieties of song, quite different from each other: the first, and the most usual, is the rapid jarring trill, from which it derives its Latin name; the second is a low whining, plaintive call, repeated two or three times, at certain intervals, resembling the words "chea, chea, chea,"

*Willow Warbler.*—Summer visitant: rather local, but, where found, common.

*Chiffchaff.*—Summer visitant: generally distributed. Some few remain throughout most winters, and have been heard chirping, in mild open weather, in December and January.

(The great migratory movement of our winter visitors seems to have taken place from Tuesday last to the end of the week, during the prevalence of the late easterly winds. Woodcocks, snipes, jack snipes, redwings, fieldfares and starlings have appeared in large numbers from the eastern part of the county to the Scilly Islands, and my nephew writes me word that on the 3rd instant he walked up in a short distance fifty snipes and thirty jack snipes at Trebartha, in the eastern part of the county, and that his keeper saw, in the morning dawn, woodcocks flying westward, which accounts for our market here being fully stocked on Thursday, and for the larder of the Governor of the Scilly Isles having yesterday morning forty-one woodcocks hanging up.—*November* 5, 1864.)

(In a paper which I communicated to you some twelve months since upon this subject, I referred to an anomaly which presented itself at this season of the year, as to the autumnal or equatorial migration, or what perhaps will be better understood as the great movement from the north towards the south, which takes place at this season of the year, popularly exemplified by the well-known and palatable migration of woodcocks and snipes from the northern countries to Great Britain and the southern countries of Europe, and to the Mediterranean Isles and the North of Africa. In that notice I mentioned that at the Wolf Rock, about nine miles from the Land's End, in a south-westerly direction, a flight of small birds, comprising some of our delicate warblers, the common wren and several other species, came suddenly from the direction of Scilly, alighted on the rock, and, after resting, pursued their flight toward the main land. On Monday last, when the Scilly packet was on her passage from Scilly to Penzance, greenfinches, chaffinches, &c., passed the vessel, going at eight knots an hour, and appeared to be in a rapid migratory course facing a direct east wind. Amongst these, but keeping separate from the main flight, were observed some *tree sparrows*, a species of rare occurrence in Cornwall. I mention this little incident to show that we are all *at sea* ourselves about the true migratorial law. We should easily comprehend the anomaly if the birds of passage in their southerly course were suddenly opposed by a strong southerly gale, but nothing of the sort was the case: the wind had been for days favourable for a southern movement, and at the time mentioned the birds were flying *against* a strong east breeze.—*November* 10, 1865.)

*Dartford Warbler.*—Killiow, Truro; rare. No very satisfactory record exists of the capture of this small warbler westward, although it has been seen in some furzy ground in the parish of Madron.

(This day Mr. Vingoe showed me a specimen which he had received from Killiow, the seat of the Rev. John Daubuz, who shot it near his residence.—*January* 11, 1869).

(I have seen a specimen to-day which was obtained by Mr. Vingoe's son on Trevida Moor.—*October* 30, 1869.)

*Goldencrested Regulus.*—Generally distributed.

*Firecrested Regulus.*—Penzance, Gwennap, Truro. One caught at the Minney, Lariggan; two others found dead together in the grounds of Michael Williams, Esq., at Trevince, and others near Truro, where three specimens were obtained in 1847. This species is now very often obtained in the Land's End district, and at Scilly.

[Its occurrence in England was first noticed in 1832, since which it has occurred at Knaresborough, Rye, Lewes, &c.]

*Great Tit.*—Generally distributed. This bird possesses, like all the species of titmouse, great variety of notes, one of them resembling exactly the sound produced by the sharpening of a saw; it utters two or three loud chirps at the commencement of spring, like the "twink twink" of the chaffinch.

*Blue Tit.*—Generally distributed.

*Cole Tit.*—Not uncommon in woods, especially in the eastern parts of Cornwall.

*Marsh Tit.*—Not uncommon in large woodlands in East Cornwall; rare in the west: generally frequents low copses, alder pollards, and withy coverts, in morasses: less numerous than the last species.

*Longtailed Tit.*—Rather local: found in small families throughout the winter, perhaps the brood of the former year.

*Bearded Tit.*—Very rare: an adult male from St. Levan, the only recorded example in this district.

[This beautiful little bird is more common in our eastern than our western counties. It used to be frequently found in the Woolwich marshes, and still occurs in some abundance in Essex, Suffolk and Norfolk. Mr. Stevenson, in his 'Birds of Norfolk,' says, "When shooting at Surlingham in the winter months, I have more than once observed the arrival of a flock from some neighbouring broad, their presence overhead being indicated by the clear ringing sound of their silvery notes, uttered preparatory to their pitching into the nearest reed-bed, and in autumn, after roosting in small parties on the reeds, they will fly up simultaneously soon after sunrise, swarming for a while like a flock of bees; and uttering in full chorus their pretty song, disperse themselves over the reed-beds for their morning's meal. Delicate as these little creatures appear I have found them during the sharpest frosts, when the snipe had left the half-frozen waters for upland springs and drains, still busy amongst the reed stems as lively and musical as ever. It is greatly to be regretted that the demand for specimens from their handsome plumage should lead to the wholesale slaughter of the bearded tits throughout the winter; added to which, the price of late years offered for their eggs has caused a sensible diminution in their numbers."]

*Bohemian Waxwing.*—Occasional winter visitant: a flight, which spread more or less over the whole of Great Britain, took place in the winter of 1849—1850.

*Pied Wagtail.*—Generally distributed. In very old birds I suspect the black summer plumage is retained perennially.

*Continental Pied Wagtail.*—Not uncommon in the spring months; easily recognised in the summer months by its light gray back, which in the common pied species is always more or less black. Falmouth, Gulval, Marazion Green, &c.

*Gray Wagtail.*—Winter visitant in the south of England: generally distributed. Some few remain throughout the summer in Cornwall, and breed; throat, in summer, black.

*Grayheaded Wagtail.*—Rare: Marazion Green. Generally observed, on their first arrival, with the yellow wagtail.

*Ray's Wagtail.*—Seen for a few days on their first arrival, and again in the autumn, on their return: Marazion Green.

*Tree Pipit.*—Summer visitant: very common in the eastern parts of the county, in the summer months: rare in West Cornwall: one killed near Pleming, in Gulval. Generally observed in large trees, in open fields, and parks, from whence the bird mounts singing, returning generally to the same tree, or a contiguous one. Song louder and very superior in quality to that of the titlark.

*Meadow Pipit.*—Generally distributed over cultivated and uncultivated land.

*Rock Pipit.*—Generally distributed on our rocky beaches.

*Tawny Pipit.*—Scilly Isles: this first example of the occurrence of this pipit in Cornwall was shot by Augustus Pechell, Esq., near Old Grimsby, Isle of Trescoe, in Scilly, September, 1868, and the specimen is in my cabinet.

*Richards' Pipit.*—Rare: several examples killed in Redinnick fields, Penzance, a few years since; specimens have since been obtained from Scilly. (Length 7½, not 6¾, inches: see Yarrell.)

*Sky Lark.*—Generally distributed.

*Crested Lark.*—The discovery of this species in this district took place at about the period of the publication of the 1st supplemental number of Yarrell's History of Birds, the bird not having been recognized as British at the time of the publication of his work. Two examples were obtained in September, 1846, from the road-side between Penzance and Marazion. Attention was drawn to the birds by the melodious character of their chirp, resembling more in character the flute-like tones of the wood lark than the buoyant song of our common sky lark. The form of the beak and the comparative shortness of the hind claw are decided characters. Another specimen was observed and subsequently secured in the latter part of October, 1860. (See 'Zoologist' of 1846 and 1850.)

*Wood Lark.*—Local; not common in the west; more frequent about Truro and Tregony.

*Shorttoed Lark.*—Very rare: a specimen shot at Scilly on September 23rd, 1854. (See 'Zoologist' for October, 1854.)

*Snow Bunting.*—Not uncommon in the autumnal months in the open high ground in Sancreed. Marazion and Newlyn Green; Hayle fields.

*Bunting.*—Generally distributed: frequents open and enclosed ground, and may be observed in nearly every hedge-row.

*Blackheaded Bunting.*—Not uncommon in marshes where bushes grew, but nowhere abundant; egg resembling that of the chaffinch. Marazion Marsh.

[I have observed that the female sings in confinement.—*E. N.*]

*Yellowhammer.*—Generally distributed in every hedge-row.

*Cirl Bunting.*—Not uncommon in hedges near Penzance towards Redinnick: eggs resembling those of the yellowhammer in markings, but the colour of the streaks in this species is dark brown, while in the yellowhammer it is reddish purple. The note of the cirl bunting is drawn out in a continuous sibilous strain, not unlike the wood wren when heard at a short distance. The strain never ends with the high note which characterizes that of the yellowhammer, but the strain is quicker and more tremulous.

*Ortolan Bunting.*—Very rare: one specimen was killed on a wall at Trescoe Abbey, Scilly, in 1851.

[I have been repeatedly offered this species by the Spitalfields bird-dealers, and have purchased one which soon became tame, and is now thriving. Concerning this bird and the green canaries often offered for sale as "serin finches," "citril finches," &c. I find it very difficult to obtain reliable information, and therefore abstain from making any observations on their native county.—*E. Newman.*]

*Chaffinch.*—Generally distributed: sings occasionally in open weather throughout the winter.

*Mountain Finch.*—Winter visitant in severe weather.

*Tree Sparrow.*—Very rare: one obtained near Falmouth some years since; since discovered at Penzance. Locally distributed in the midland counties.

*House Sparrow.*—Generally distributed.

*Greenfinch.*—Generally distributed.

*Hawfinch.*—Winter visitant: appears singly, and sometimes in small flocks, at uncertain intervals. Lariggan, &c. One or two specimens seen in the gardens at Trescoe Abbey, Scilly.

[We must cease to regard the hawfinch as merely a winter visitant. Mr. Doubleday, in the first place, and several ornithologists subsequently, have obtained specimens at all seasons of the year, and have proved beyond all question that it breeds freely in England.—*E. N.*]

*Goldfinch.*—Rather locally distributed.

*Siskin.*—Winter visitant: rare in the county generally. Lariggan, Gulval, &c.

(Siskins appeared in considerable numbers on the 2nd of December, 1867.)

*Linnet.*—Universally distributed.

*Lesser Redpole.*—Very rare throughout the county.

*Mountain Linnet.*—Very rare; one specimen only recorded as captured in the Penzance district.

*Bullfinch.*—Locally distributed and nowhere numerous.

*Crossbill.*—Rare: seen at distant and uncertain intervals in small flocks. Rosemorran, Trebartha woods.

(I believe I have mentioned the general distribution of the bird in the Land's End locality, extending to the Scilly Isles. I find from correspondents that the eastern part of the county has had an immense immigration of this species, and from what I have seen and heard during the past week the numbers appear to be steadily on the increase. I have received from Scilly for some weeks several specimens, and seven or eight specimens were brought over yesterday from the Abbey gardens at Trescoe. I have received no specimen in a vermilion state of red, but in those specimens where the colour of red prevailed at all there was generally a subdued dull tile-red tone, clouded over with brown and bluish gray more or less. One of the specimens from Scilly yesterday was remarkable for its colouring; the upper tail-coverts were bright canary-yellow, and the rest of the body was intermixed with blotches of red, brown, gray and yellow. A very large proportion of the specimens which have come under my notice have been a dull brown, with an extra tone either of red, yellow or green on the upper tail-coverts.—*July* 29, 1868.)

[The migration of crossbills into Cornwall to which Mr. Rodd here alludes as having taken place in July, 1868, was noticed also by a correspondent in the 'Field' of that date. Similar and simultaneous immigrations were observed in several parts of Ireland, also in Devonshire, Somersetshire and Gloucestershire.]

[In his 'Spring and Summer in Lapland' the late Mr. Wheelwright has some such original observations on the variation in plumage to which Mr. Rodd refers, that I think no apology is required for introducing them here: the change and variation in plumage to which these birds are subject has long engaged the attention of our best ornithologists, and much may be learned from so excellent an observer as Mr. Wheelwright:—"As regards the crossbills, I can clearly prove, by specimens killed in a state of nature, that they have four distinct dresses, assumed at different ages, and these I will shortly describe. The first dress, after just leaving the nest till up to the first moult in the autumn (in September), is greenish brown, with dark longitudinal streaks down each feather; and in this first plumage there is little difference between the male and the female. In the nest plumage the beaks of the young birds are straight; but the mandibles soon begin to cross each other after leaving the nest, and in young birds of the year, killed by me in November, the beak was nearly as much crooked as in the older birds. Sometimes the point of the under mandible crosses to the right, sometimes to the left. As soon as the first autumnal moult is complete, the females are easily distinguished from the males. The young striped feathers are very apparent in both, all through the winter and following spring; but all the under parts are tinged in the young males with yellow-orange, and in the females with bright yellow. In the males the heads and rumps are orange, in the females only tinged with yellow. In not one single young male of the year which I have shot in the winter (and the birds of the year are easily distinguished at this season by the presence of the dark-striped feathers) was there the slightest indication to lead one to suppose that he would become red before the next moult. The question is, when will that moult take place? some fancy in May, some in the ensuing September. I think it very probable that a change in colour takes place in May; for it appears to me that this orange-colour gradually reddens without moulting. And so much do the shades vary that scarcely two young males are exactly alike. It is impossible to say how long this young plumage lasts, but I am inclined to think certainly until the second autumnal moult of the bird, perhaps gradually becoming redder, and probably in many birds even longer; for early in November I have killed young males of a beautiful orange-red colour, which from their size and general appearance, and the total absence of the dark striped feathers of youth, could not have been birds of the year. These orange birds might certainly have been bred very early in the preceding spring, but I think not, and I almost feel confident that this orange-red colour is a gradual transition to the red dress, or else that the mature male crossbill owns two dresses—*i.e.*, that some birds of the same age are orange-red, and others deep red. Of one thing, however, I am perfectly convinced, that *none* of the young males obtain the full deep red dress at the *first* autumnal moult. In the year 1863 I obtained the males breeding in the same woods in three different dresses—*first*, in the early striped dress above described (these were evidently birds of the year); *secondly*, in this orange-red dress; and *thirdly*, in the deep red dress. I am at present of opinion that this orange-red dress is a transition gradually assumed between the first autumnal dress and the deep red plumage in which we usually see the male crossbill depicted, and which I consider their standard livery, and worn by them longer than any other. I may remark, however, that in our forests we meet with far more of the deep red birds than of these orange-plumage males. Respecting the bright yellow-green dress which the old male crossbills occasionally assume (but which, although so rare that we very seldom meet with it, we must nevertheless still consider as *normal*), it is hard to say at what age it is assumed, but we may reasonably infer at a very advanced period of life *in a state of nature;* though it is said that as soon as either a male crossbill or grosbeak is confined in a cage, it changes from red to bright yellow-green at once, and this colour it wears till it dies. This may or may not be the effect of confinement, but as I have killed the old birds of both in this yellow-green plumage in a state of nature, I for one do not hesitate to pronounce it normal. This latter dress can never be confounded with the yellow-orange plumage of youth by any one who has had opportunities of comparing the two. In the summer the red dress of the male crossbill appears to become darker, and the only change that I can observe in the female is that the yellow shading on the head and rump become brighter with age, but always brightest in the breeding season."]

[The following observations on the breeding habits of the crossbill from the same accomplished writer, will, I am sure, be considered in place here:—"I fully agree with Thompson that 'he is inclined to consider the crossbills as a wandering tribe, having no proper home, but who pitch their tent and take up their residence at a place just so long as it suits them, without contemplating a return to any particular region.' This is peculiarly the case in our forests: they appear to leave us as suddenly as they come, and as soon as the breeding-season is over they leave for other districts, and we see very few, often none, in the summer. It is not every year that we have them, and it is singular that we rarely ever have both the parrot and common crossbill breeding with us in the same year. I take it all depends upon the state of the cones on the pines and firs. When there are plenty of fir-cones in the autumn, it is pretty certain that we shall have the common crossbills breeding with us that winter, and the same with the parrot crossbills where the cones on the pines are plentiful. But this appears to happen in our forests only about every third or fourth year. One curious fact I have observed, which is this, that if we see large flocks of crossbills in our forests in the autumn (they generally appear about September or early in October) we shall have very little snow that winter. The pairing season begins about the middle of January, when both male and female have a very pretty song; that of the female, however, much the faintest. Were it not for the difference of the landscape, we might almost at this season imagine ourselves in the tropical forests of the south, when we watch a little flock of these birds feeding, flitting from cone to cone, or climbing over them with their backs downwards, like the parrots, their bright-red or orange plumage reflected in the rays of the afternoon sun (at which time they are generally busiest feeding), which even at this inclement season gilds the tops of the firs for an hour or two before sinking below the horizon. They go to nest often in the end of January, always by the middle of February. The nest of both species is placed (almost invariably) in a small pine, near to the tip, close in to the stem, never in a deep forest, but always with us on a stony rise, where the pines are small and wide apart. The parrot crossbill generally goes to nest a little later than the common one. By the middle or end of April the young birds are strong flyers, and we *never take a nest with eggs after that month.* The nest of both species is much alike (that of the parrot crossbill thickest and largest); built outwardly of dry fir-sticks, lined thickly with moss and grass. The eggs much resemble those of the green linnet, but are always larger. The egg of the parrot crossbill is often scarcely larger than that of the common bird, although usually it is thicker and has a finer and bolder character. The full number of eggs appears to be three, and it is very rarely that we find four in a nest. Some naturalists say that the crossbills breed at all seasons, from December to June, and that the winter nest is domed, with a hole in the side to go in at. All I can say is (and I have had now some years' experience with these birds) that I consider their breeding-season as regular as that of any other bird, at the period I have before stated; and as for a domed nest, I never saw such a thing. I have often wondered why nature should have neglected this provision as regards the crossbill—for in the end of March, 1863 (in which year I took above thirty-five nests out of our woods), when the weather was very stormy and rainy, I found more than a dozen nests in which the unfledged young had perished through the inclemency of the weather."]

*Whitewinged Crossbill.*—Rare: an adult bird killed at Lariggan some years since, and now in a private collection at Penzance.

*Starling.*—Universally distributed in the winter months, in flocks; rare in summer.

*Rosecoloured Pastor.*—Several examples have been obtained from the west of Cornwall, an adult bird from Scilly, and apparently a female from Gwithian, near Hayle, also from the neighbourhood of the Land's End.

*Chough.*—Much less common than formerly; sparingly observed in different localities on the coast; breeds annually in Zennor cliffs.

[Still common round the rock-bound coast of Pembrokeshire and Cardiganshire, where they breed.—*E. Newman.*]

*Raven.*—A pair may be observed in most of the ranges of our cliffs, where they principally breed.

*Carrion Crow.*—Generally distributed.

*Hooded Crow.*—Rare: occasional visitant. Formerly abundant on Marazion Green, whence it derived one of its synonyms of "Market-Jew Crow."

*Rook.*—Generally distributed.

*Jackdaw.*—Generally distributed.

*Magpie.*—Generally distributed.

*Jay.*—Common in the woodland districts of the county, but in the neighbourhood of Penzance and westward unknown.

*Green Woodpecker.*—Very common in the eastern woodlands; very rare in west Cornwall, and almost unknown in the neighbourhood of Penzance. Trevayler bottom; Castle Horneck.

*Great Spotted Woodpecker.*—Rare: sometimes seen in the eastern woodlands: a specimen now and then obtained from Treneere lawn, and Trevayler, near Penzance.

*Lesser Spotted Woodpecker.*—Rare: a specimen obtained from North-hill. The note of this bird exactly resembles the roosting call of the common blackbird.

*Wryneck.*—Rare in all parts of the county: occasionally observed in the neighbourhood of Penzance in the autumn, near the coast, probably preparing for migration. Some specimens were obtained at Scilly, with other migratorial birds, in the autumn of 1849. See woodchat shrike, pied flycatcher, &c. Fowey, North-hill, Zennor, Scilly.

*Creeper.*—Commonly distributed where large trees grow. Trevethoe, Lariggan, &c.

*Wren.*—Generally distributed.

*Hoopoe.*—Examples of this bird are generally to be obtained every spring: they have been observed at Scilly every year since 1843. Ludgvan, Madron, Scilly. (No less than four of these beautiful birds were killed in the second week in April, 1869).

*Nuthatch.*—Very common in the eastern woodlands, becoming more rare westward, and almost unknown in the neighbourhood of Penzance: eggs exactly resembling those of the great tit.

*Cuckoo.*—Generally distributed in the summer months.

*Yellowbilled American Cuckoo.*—On the authority of the notice in Yarrell's work.

*Roller.*—An adult specimen seen some time since by Mr. J. N. R. Millett, of Penzance, near the Land's End; a female shot at St. Levan: is in my collection,—plumage dull: another female specimen was obtained from St. Levan in September, 1865.

*Bee-eater.*—The only instances of the occurrence of this bird in this county was the capture of a flock of twelve near Helston, in 1828, and which came into the possession of the late George Borlase, Esq., of that place; and, on the authority of Mr. Couch, of Polperro, four specimens were seen in the parish of Madron.

*Kingfisher.*—Generally observed on the sea-coast, where rivers and streams empty themselves in the sea, also in creeks and inlets: nowhere common, but generally observed, from its attractive metallic colours.

*Swallow.*—Summer visitant: universally distributed.

*Martin.*—Summer visitant: universally distributed.

*Sand Martin.*—Summer visitant: generally distributed in the neighbourhood and within reach of sand-banks. Lelant, Marazion, and Newlyn Greens.

*Common Swift.*—Locally distributed. Marazion Green.

*Alpine Swift.*—Very rare: one example taken near the Lizard, and afterwards preserved by Mr. Jackson, of Looe. One specimen of the

Alpine swift in adult plumage was captured in the parish of Mylor, in the summer of 1859. See 'Zoologist.' This specimen is in my cabinet.

*Nightjar.*—Locally distributed. Trengwainton; Sancreed.

### RASORES.

*Ring Dove.*—Generally distributed where trees, shrubberies, and plantations exist.

*Stock Dove.*—Rare in the western counties . two specimens obtained from Scilly a few years since. Large flocks seen occasionally.

[More precise information is desired respecting the enormous flocks of this bird reported last year.—*E. Newman.*]

*Rock Dove.*—Found occasionally in the cliffs on the south coast of Cornwall, about Looe and Polperro: one killed at Carn Galva, Madron.

*Turtle Dove.*—Summer visitant: generally observed, in more or less numbers, in the spring months, in sheltered valleys. Pleming; Gulval; Madron; Scilly.

*Black Grouse.*—Very rare in Cornwall: occasionally seen in the eastern moors; one reported to have been shot at Castle-an-dinas, Gulval, some years since. Hybrids between this species and the common pheasant have been killed in the parish of North-hill.

*Pallas' Sand Grouse.*—The general distribution of a flight of this oriental species (which has hitherto only been noticed in the great sand deserts in western Asia, and in the eastern portions of Europe) over the whole of the British Isles, from John o'Groat's house to the Land's End and the Scilly Isles, and from Norfolk to Ireland, during the summer of 1863, entitles it to be ranked amongst the British wild birds. Some specimens showed eggs in the ovarium more or less developed, and one female in particular from the naked state of the breast and belly gave strong evidence of incubation. (See 'Zoologist' for 1863.)

*Partridge.*—Universally distributed.

*Common Quail.*—Rare : occasionally seen singly in the neighbourhood of Penzance.

*Great Bustard.* — One observed and afterwards captured on Goonhilly, Lizard district: this proved to be a female, and is now preserved in a private collection at Penzance. Another example of the great bustard was obtained from the immediate neighbourhood of St. Austell, near Polgooth mine, in the month of January, 1854, and which was recorded in the Cornish papers; it was reported to be a female: the bird was preserved at Falmouth, by Mr. Chapman, and the owner, Mr. Williams, butcher, of St. Austell.

*Little Bustard.*—Very rare: one obtained from the neighbourhood of Trelowarren. Two specimens (females) of the little bustard were brought to Penzance and sold to the poulterers in December, 1853. The last I purchased for half-a-crown, and I was told that two or three others had been killed and one offered for sale and rejected.

(A very fine bird of this species, which from its size I should think was a male, came into the hands of Mr. Vingoe for preservation yesterday, from the Lizard. The plumage was entirely plain from the throat downwards, showing no trace of the crescentic black markings which characterize the male in summer plumage. The roseate tint which pervades the basal parts of the feathers, and the down on the back and breast next to the skin, quite equal in intensity the under plumage of the roseate tern.—*October* 30, 1869.)

### WATER BIRDS.

*Great Plover.*—Occasionally observed in the Land's End district in the winter months, and one or more examples captured every year, although it is referred to by authors as a summer visitor elsewhere.

*Golden Plover.*—Generally distributed in the winter months over the open heaths and moors: large accessions after severe frost, when the fallow fields are visited by them; sometimes observed in March with the black breast and belly partially developed.

*Dotterel.*—Rare: open moors and sheep-walks; an inland species: one specimen killed in Sancreed.

*Ringed Plover.*—Generally distributed along our sea-shores, and very often associated with the dunlin: breeds early; eggs found at Scilly in April; legs and feet yellow.

*Kentish Plover.*—A specimen obtained from Marazion beach, the colour of the legs in this species, which is black at all ages, distinguishes it from the last-named species, as well as its smaller size.

*Little Ringed Plover.*—Very rare as a British bird. A young bird of the year, corresponding in every particular with the figure in Gould's 'Birds of Europe,' was shot by F. R. Rodd, Esq., near the higher pond of Tresco, Scilly, in October, 1863. See 'Zoologist' for further particulars.

*Gray Plover.*—Occasional winter visitant, especially after severe weather. Marazion Green. This bird has been obtained from this neighbourhood with all the under parts entirely black, and the summer plumage completed.

*Lapwing.* — Locally distributed. Trevear, Sennen; Tregavara moor, Madron.

*Turnstone.*—Observed in the spring and autumn migrations, and at these times common on our flat beaches. Marazion sands.

*Sanderling.*—Not a very numerous species: specimens in winter and summer plumage frequently obtained. Hayle estuary, Marazion sands, Scilly, &c.

*Oystercatcher.*—Not uncommon on the western coast of Cornwall: occasionally seen on Marazion sands, Newlyn beach, and Scilly. Breeds at Scilly.

*Heron.*—Generally distributed in suitable localities, especially in creeks and estuaries. These is a heronry on the Lamorran river, near Truro; another near Fowey.

*Purple Heron.*—Two adult examples in perfect plumage obtained in the county within the last few years: *viz.*, Killiow, Kea; Trevider, St. Buryan.

*Squacco Heron.*—Occasional visitant: St. Hilary, St. Levan, Sennen, Trereife, Madron, Scilly. Generally obtained in immature plumage, sometimes the dorsal and occipital plumes partly developed.

*Little Bittern.*—Very rare: a specimen was killed at the Lizard district. An adult male killed at Tresco, Scilly, in June 1866 (in my collection), another at St. Hilary.

*Common Bittern.*—Not uncommon at uncertain and generally distant periods; frequents morasses, sedgy moors, &c.

*Night Heron.*—Occasionally met with and specimens obtained from East and West Cornwall, also in immature plumage: a young bird was brought me alive, some years since, caught between Penzance and Newlyn. The cry of the bird resembled the word "qua, qua," uttered with a hard scream: colour of the iris, orange-red. The Lizard, Crowan, Scilly, &c.

(A few days since a male and female night heron were shot near Hayle on our north coast; they are both well-plumaged birds, with three occipital plumes: the female is a little duller in plumage than the male, but in other respects is very similar; the ovary contained eggs, some about the size of a small bean.—*May* 2, 1870.)

*White Stork.*—Very rare: only one recorded instance, and that at the Land's End, in May, 1848; it was obtained from the grounds of the late James Trembath, Esq., of Mayon House.

*Black Stork.*—Very rare: a good specimen killed either on the Tamar or Lynher, in 1831: this was the second recorded instance of its capture in Great Britain, and the specimen is in my cabinet.

*Spoonbill.*—Occasionally, and especially of late years, observed in various parts of the county; a flock of several was seen and captured at Gwithian; others have been obtained from the neighbourhood of Penzance, and also from Scilly.

*Glossy Ibis.*—On September 19th, 1854, I received information of the capture of the glossy ibis at Tresco, Scilly. I examined the specimen afterwards and observed that the plumage was immature, being that of a bird of the second year, the brown of the head and chin being streaked with white; upper parts of the plumage, including the tail, glossy greenish bronze with faint purplish tints. One said to have been killed at Paul.

*Curlew.*—Common on the sea-coast, and in harbours, creeks and estuaries: it is rarely seen in the summer months in this locality, but it is observed in the large moors about Roughtor, Brownwilly, &c., where it is known to breed.

*Whimbrel.*—Observed in the latter part of April, and again in the autumn, in going to and returning from their northern breeding-grounds: small flocks may be seen on the flat open beach between Penzance and Marazion. When disturbed their note resembles the words "luddle, luddle, luddle, luddle," quickly uttered.

*Spotted Redshank.*—Rare: occasionally met with in the autumn months. First observed at the Land's End in 1840, since which several examples have been obtained.

*Common Redshank.*—Not uncommon on salt marshes, and on sandy estuaries, in the autumnal and winter months; sometimes in the spring. Hayle estuary, Marazion marsh, &c.

*Bartram's Sandpiper.*—(See Yarrell's 'Supplement,' p. 40). A specimen of T. Bartramii was shot at or near Goonhilly, on the 6th of November, 1865, which I examined in the hands of the preserver, and is now in the possession of Dr. Bullmore, of Falmouth.

*Green Sandpiper.*—Several specimens obtained of late years from the Land's End district, towards the autumn: more inland in its habits than the last-named species.

EDWARD HEARLE RODD.

(To be continued.)

## *Extracts from a Memoir intituled 'A Monograph of the Alcidæ.'*

By ELLIOTT COUES, A.M., M.D.

(Continued from S. S. 2214).

*Simorhynchus pusillus* (Pallas), Coues.—Habitat: Asiatic and American coasts of the North Pacific. Kamtschatka (Pallas). Semiavine Straits (Mus. Smiths. Inst.) N. W. coast of America (Mus. Smiths. Inst.) Sitka, Russian Amer. (Mus. Pays-Bas, teste Schlegel).

In *size* the least of its genus, and the smallest known natatorial bird. Length (approximately correct) 5·50 inches; extent of wings ——, wing from carpus to end of first primary 3·50; tail 1·10; tarsus ·75; middle toe and claw 1·10; outer toe and claw 1·00; inner toe and claw ·85; bill along culmen ·40; along rictus ·65; along gonys ·30; height at base ·20; width at same point the same or slightly less. (Compare these measurements, particularly of the bill, with those of S. microceros).

With the usual *form* of the genus, except as to the bill, the shape of which is specific. Bill without tubercles, or other irregularities of contour; straight, comparatively slender, compressed; height at base much less than length along culmen; width at base the same, or rather less than, height at same point; the apex more acute than that of microceros; the outline of culmen at first straight, then slightly convexo-declinate; commissure almost straight, a little ascending anteriorly, still not sinuous in any part of its length; gonys lengthened, at first convex in outline, then rapidly ascending in a straight line. Nasal fossa large, extending along the basal moiety of the bill, reaching from the culmen nearly to the tomia; not deeply excavated; nostrils small, narrow, linear, one-eighth of an inch long, basal, lying just above the commissural edge of the upper mandible. Frontal feathers running forward some distance in a rather narrow angle on the culmen, retreating very rapidly obliquely backwards and downwards on the sides of the upper mandible; extending on sides of the lower mandible a little further than on upper. (It is to be gathered from this description, more particularly, that the bill of pusillus, compared with that of microceros, is fully as long, but slenderer, more acute at the tip, less convex along culmen and gonys, more compressed in its whole extent, and non-tuberculate.)

Adult.—Entire under parts pure white; entire upper parts pure black, only relieved as follows:—The humeral and scapular feathers are, all of them or most of them, white or whitish in some portion or the whole of their extent; producing two patches of this colour, not inaptly comparable to the similar patches on the scapulars of Brachyrhamphus Wrangeli, or Collyrio borealis, in size, shape and general appearance. About half the secondaries, the innermost ones, are quite conspicuously white on the tips of the outer web for a fourth or a third of an inch. The forehead and lores, from the base of the bill to the eyes and vertex, are lineated (exactly as in microceros) with sparse, distinct, very slender white setaceous feathers; none are apparent, among several specimens, behind the eye, or from the commissural angle of the bill. Pallas tersely summed up these points of coloration of the upper parts in saying "Fronte brachiisque albonotatis;" and the white about the "arms" is a strong distinctive feature of the species in comparison with microceros. The white of the under parts reaches far around on the side of the neck; on the side of the head it only extends on a level with the commissure; it does not quite attain the base of the lower mandible, being cut off from the bill by a small blackish lead-coloured area. There are indications of a small whitish spot just above and below the eye, formed of feathers of the ordinary texture. The under wing-coverts are wholly white, except just along the edge of the forearm. The short tibial feathers are dusky gray. Bill black (as nearly as can be determined from the dried specimens), the base, gonys and tip of lower mandible yellowish. Posterior aspect of tarsus, and inferior surface of toes and webs, blackish; rest of legs and feet a dull undefinable greenish-dusky (in the dried specimens).

The changes of plumage of this species are not known; no other condition than the one above described is represented by the specimens in the Smithsonian Institution, and none are contained, as far as known, in any other American museum. No. 21,320 of the Smithsonian collection, obtained from Capt. John Rodgers' expedition to the North Pacific, collected at Semiavine Straits, by Dr. Wm. Stimpson, is the one above described. No. 21,321, from the same locality, is a younger bird, but entirely similar to 21,320, except that it has a rather weaker bill, and only slight traces of the white setaceous feathers on the forehead. No. 46,562, collected September 9th, 1866, at Plover Bay, by W. H. Dall, of the Western Union Company's Overland International Telegraph Expedition, a young bird, as shown by the soft feel of the feathers and other features needless to detail, is referrible, with some degree of doubt, to this species. The scapulars are very conspicuously white; the secondaries plainly tipped with white; the under parts pure white, unspotted as in typical pusillus. The black of the upper parts is tinted, especially about the head, with gray or plumbeous, and there are no traces of whitish setaceous feathers on the forehead; both of which features are to be attributed to the juvenility of the specimen. The doubt in the case centres in the bill. This organ has no trace of a tubercle, and is very small and weak, as usual in the young pusillus; but it *seems to be* deeper, and especially wider at the base, compared with its length, than is the case with typical pusillus; in these points of shape approximating to microceros. But "seems to be" is the most definite expression to be used in this case, for in the preparation of the specimen, or its subsequent drying or packing for transportation, the bill has been injured, and so much distorted, that its true form cannot now be determined with desirable precision.

It cannot be denied that the relations that this species bears to microceros are extremely intimate. So closely, in fact, does it approach the latter, that its specific validity might fairly be called in question by one of conservative views; especially in consideration of the well-known fact, not to be disputed, that the bills of all young Alcidæ are much smaller and weaker, and even in more striking points of form, conspicuously different from those of adult birds; and that a long time is required for their perfect development. This remark applies with especial force to the formation of the various knobs, ridges, sulci, rictal callosities, and the other irregularities of surface. The mere presence or absence, therefore, of the node upon the base of the culmen, cannot be allowed to constitute a specific character in the present case, and may be left out of consideration, as may be, also, the colour of the bill. Too much stress should not be laid upon the presence of white scapulars and of white tips to the secondaries, since in some specimens of undoubted microceros unmistakable traces of the former are to be found, and the ends of the inner secondaries are decidedly lighter than the body of the feathers. All the observable differences in the quantity and distribution of the whitish setaceous feathers upon the forehead and other parts of the head might readily enough depend upon a difference in the age of specimens. The pure uninterrupted white of the under parts of pusillus stands in apparently strong contradistinction to the black mottling of the same parts of microceros; but it is to be remembered that the coloration in this respect of the latter species is very variable, ranging from a very sparse and scanty marbling to a nearly uniform black, particularly upon the breast, and is therefore not to be too implicitly relied upon, at least until it is more definitely ascertained than at present whether the black mottling tends to decrease or to increase with advancing age. If microceros grows more and more marbled with black as i grows older, we might with entire propriety presume upon the existence of a youthful state of plumage, in which the under parts are entirely white, like those of pusillus. Such is very likely the real state of the case; for the youngest examples of microceros examined—those which have no trace of a tubercle—are nearly white below, only very sparsely and indistinctly mottled with blackish. Still, aside from all these varying and therefore uncertain points, there appear good grounds for separating the two species, as will be observed on comparing the descriptions given in this and in the preceding article.

As the case stands with our present information upon the subject, P. pusillus is to be separated from P. microceros: first, by certain differences positively known to occur; *a*, in size, which is decidedly less, as evidenced by the measurement of all its dimensions; *b*, in form of bill, which is slenderer, more acute at the tip, not so deep at the base, particularly not so wide at the base, yet not shorter, than that of microceros: secondly, by certain differences very commonly observed, yet not proven to always hold good; *a*, absence of tubercle; *b*, conspicuously white scapulars and tips of secondaries; *c*, pure white under parts, uninterrupted by blackish mottling, and extending around on the sides of the neck; *d*, shortness and scantiness of the white setaceous feathers on the forehead; *e*, colour of bill, mostly black, not mostly red.

It only remains to notice the synonymy of this species; and all that is to be said on this score relates to the identification of Alca pygmæa, *Gm.* This name is founded upon the "Pigmy Auk" of Pennant,—a small species first described very loosely and imperfectly by the latter writer, whose account Gmelin merely renders into Latin in applying a binomial name. There is no doubt that the bird was one of the little auks of the North Pacific, as its very name, and the dimensions assigned (seven inches), clearly indicate, but there is no possibility, at the present day, of identifying it with precision. It was very possibly based either upon the present species or the preceding (microceros), and should these two ever be united, as young and old of the same, the name pygmæa might without undue violence be assigned to the species so constituted. So long as they are regarded as distinct, the name pygmæus must not be applied to either of them. As far as we can judge by the description, particularly the expression "jugulo et pectore glaucis," pygmæa may not impossibly have been based upon Ptychoramphus aleuticus. But Mr. Cassin's supposition is perhaps as near the truth as any that could be advanced: "It is possible that the pigmy auk of Pennant, which is Alca pygmæa, *Gmelin*, may be the young of this species (microceros), but it is more probable, judging from the descriptions of Gmelin and Latham, that several small species have been confounded under this name." The same gentleman also calls attention to the fact, that some of the expressions in the diagnoses of the old authors have no basis in the characters of any Alcidine bird. Under the circumstances, it behoves us to ignore the name pygmæa altogether, since it cannot be identified; and to accept pusillus of Pallas, to which no possibility of doubt attaches, as the proper name of the present species.

### Genus PTYCHORHAMPHUS, *Brandt.*

Size moderate; general form stout; not crested, nor with any elongated feathers about the head. Bill about two-thirds as long as the head, three-fourths as long as the tarsus, very stout, straight, somewhat conical in shape, slightly if at all compressed, without nodes or irregularities, the tip acute; culmen very moderately declinato-convex in outline, the ridge broad, more or less corrugated transversely at the base; the sides of upper mandible bulging, the tomial edges inflected; sides of lower mandible nearly upright, flat, longitudinally grooved for the greater part of their length, their tomial edges somewhat inflected; rictus straight; gonys straight, or nearly so, very long. Nasal fossæ long and wide, shallow, filled in with soft skin; that of the two fossæ meeting over the base of the culmen, and there corrugated as just described; nostrils rather long, narrowly oval, subbasal, opening at the lower border of the fossæ, the edge of the membrane that overhangs them elevated, flaring. Frontal feathers in a nearly transverse line across the base of the culmen, thence descending a little obliquely backwards, just behind the nostrils, to the commissure; those on lower mandible extending, in the interramal space (which they completely fill), to a point rather beyond a perpendicular from those on culmen; then, encroaching very little on the sides of the lower mandible, they retreat in a straight line rapidly backwards and obliquely upwards. Wings moderately long, narrow, pointed, the primaries somewhat falcate, narrowing rapidly at the tip to an acute point, first longest, rest equally graduated. Tail short, broad, rounded, contained about three and a half times in the length of wing from the carpal joint; the feathers broadly rounded at their tips. Tarsus much shorter than the middle toe without its claw; about two-thirds as long as the middle toe and claw; greatly compressed, covered with small, very irregularly shaped polygonal reticulations; no large transverse scutella. Outer lateral toe as long as, or slightly shorter than, the middle; its claw not reaching the tip of the middle claw. Tip of inner claw reaching base of middle one. Claws compressed, acute, moderately arched, the inner edge of the middle one dilated.

This genus was instituted in 1837 by Prof. Brandt, for the reception of the Uria aleutica, of Pallas, its type and only species. It is strongly characterized by the bill, which is of a shape not even approximating towards that of any other Alcidine bird. Its points of structure in other respects are shared by the majority of the family,

*Ptychorhamphus aleuticus* (Pall.), Brandt.—Habitat: Pacific coast of North America, south to San Diego, California. Breeds on the Farralone Islands, Aleutian Islands (Pallas), Russian America, and whole west coast of the United States. (Mus. Smiths. Inst. and Acad. Philad.)

Adult.—Bill black, base of lower mandible whitish or yellowish. Legs anteriorly and toes superiorly bluish; legs posteriorly and toes inferiorly, with the membranes, blackish. A slight touch of white about the eyes. Entire upper parts blackish plumbeous, the head, wings and tail nearly black. This colour, gradually diluted until it is much more grayish plumbeous, extends around the under parts and sides of the head, the throat, upper part of the breast, and whole sides of the body under the wings. Greater part of breast, with abdomen and under tail-coverts, pure white; the grayish plumbeous of the upper breast merging very gradually into the white of the belly. Under surface of wings dark lustrous gray.

Young.—Very similar to the adult; differing chiefly in being more decidedly blackish on the upper parts.

Moulting specimens have the upper parts much duller and grayer, the old wing and tail-feathers faded, especially towards their tips, into light brownish gray.

Length 8·30 to 9·50; extent 16·00 to 18·50; wing 4·75 to 5·25; tail 1·50 to 1·75; tarsus about 1·00; middle toe and claw 1·40; outer do. 1·30; inner do. 1·10; culmen ·75; rictus ·90; gonys ·60; depth of bill opposite posterior extremity of nostrils ·40; width ·30.

As regards colour, this species is remarkably constant. Hardly any other differences than those first noticed are to be found, after examination of extensive series; and they may all be summed up as merely varying shades of the same colour, and slight variation in its extent downwards upon the breast. The bill at all ages and seasons presents its peculiar parti-coloration. These remarks, however, probably do not apply to fledglings. As regards size, the species is perhaps unusually variable, as may be seen by the measurements given above, which represent extremes in those cases where two sets of figures are given, and the average in other measurements. The bill, in particular, is liable to great variation both in length and in stoutness. Some bills are very large and robust, nearly as wide as high at the base, rather obtuse at the tip, and with decidedly curved culmen and gonys; others are longer in proportion to their transverse dimensions, decidedly compressed throughout, acutely pointed, with almost straight culmen and gonys. The corrugations about the base of the upper mandible are sometimes nearly obsolete, and when present are very variable in character. Very likely they are hardly, if at all, apparent in life; for they seem to be produced mainly by the shrinking in drying of the skin covering the nasal fossæ and base of the culmen. All the variations exhibited by the numerous specimens seem to be merely individual differences, and are not sufficient to excite a suspicion that more than one species is represented in the series.

Mergulus Cassinii, *Gambel* (Arctica Cassinii, *Gray*), is now well known to be this species, first described by Pallas, as above quoted. The species has no other synonyms of consequence. Its striking peculiarities suffice to prevent misconception regarding it.

### Subfamily URINÆ.—MERGULUS (*Ray*), *Vieill.*

Bill very short, culmen only three-fourths the tarsus, very stout, scarcely compressed, obtuse at the tip, as wide as high at the base, the sides of both mandibles convex or vaulted, the tomial edge of the upper greatly inflected, the culmen very convex in outline, with a broad flattened ridge, the rictus ample, much decurved towards the end, the gonys straight, very short, the inferior mandibular rami correspondingly elongated, widely divaricating, the interramal space very broad, the nasal fossæ short, wide, deep, partially feathered.

Nostrils subbasal, short, more broadly oval, or more nearly circular than in any other genus except Synthliborhamphus. Wings rather longer than usual in this family, acutely pointed. Tail of ordinary length, much rounded, the feathers rather narrow and subacuminate at tip. Feet small and weak; tarsus scarcely compressed, anteriorly broadly scutellate, posteriorly finely reticulate. Toes of the usual proportionate lengths. Size very small; general form very compact, stout.

A peculiar genus of the Alcidæ, the most essential characters of which, as usual in this family, are found in the bill, though the other members offer some appreciable, if not salient, features. The squat bunchy shape of the single species is very noticeable.

This is the genus through which a certain type of structure found among the Longipennes inosculates with the Pygopodes. The relationship of Pelecanoides urinatrix to Mergulus alle is one of strong analogy, if not of actual affinity, as has been elsewhere already pointed out by the writer.* Aside from the obviously Procellaridian characters of the bill, Pelecanoides (representing the subfamily Halodrominæ) is strictly a Pygopodous genus, and is very nearly identical with Mergulus in all the details of external structure, and has much the same general habit. It is certainly the connecting link between the macropterous and brachypterous natatores, holding so strangely anomalous a position betwixt the two, that it cannot be with much propriety included under either. It seems entitled to the rank of a family, to take place between the Procellariidæ and Alcidæ.

*Mergulus alle*, (Ray), Vieill.—Habitat: European and American coasts of the North Atlantic. On the United States coast, in winter, south to New Jersey. Numerous specimens in Mus. Acad. Philad., Smiths. Inst., Bost. Soc. Nat. Hist., Essex Inst., Cab. G. N. Lawrence, author's Cab., etc.

Adult, summer plumage.—Head and neck all around, and entire upper parts glossy black, with a beautiful metallic lustre of a shade of blue, when in highest plumage; scapulars edged with white; shafts and inner webs of primaries brown, lighter at base; secondaries tipped with white; under surfaces of the wings brownish gray; under parts from the breast pure white, with a few elongated feathers of the sides and flanks varied with black on the outer webs; bill black; legs and feet posteriorly blackish, anteriorly flesh-coloured (dull yellowish in the dried state).

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* *Cf.* Pr. A. N. S. Philad,, May 1866, pp. 172, 189.

Adult in winter.—As before; the white of the under parts extending on the neck and throat to the bill, on the sides of the head to the level of the rictus, on the sides of the nape over the auriculars (where it is somewhat marbled with black), or even to the middle of the nape, more or less confluent with that of the other side.

Young, first winter.—Recognizable by its smaller and weaker bill, by the duller and more brownish black of the upper parts, almost wanting in gloss, and by the greater extension of the white upon the sides of the hind head and neck. The scapulars and coverts are conspicuously marked with white, as in the adult. The feet are mostly dusky.

Length 8·50; wing 4·75; tail 1·50; tarsus ·80; middle toe and claw 1·20, outer do. 1.15, inner do. ·85; bill along culmen ·50, rictus 1·00, gonys ·20; its depth at base ·35, its width at same point about the same.

When in mature plumage this is a very beautiful species. No other Alcidine has such lustre of the dorsal plumage, traces of which are even found in adult winter specimens. In the latter the extent of the black upon the throat is indicated by a dusky clouding of the bases of the feathers of the parts. The species is ordinarily subject to only moderate variation in size or colours. The condition of albinism has been described.

The first chronicles of this species are of great antiquity. It appears to have shared for a time with Uria grylle the soubriquet of "Columba grœnlandica." Since its description as Alca alle, by Linnæus, it has been the basis of very few synonyms. Alca candida, of Brünnich is this species in the albino state. Mergulus melanoleucus, *Ray*, is adopted by many authors. Mr. G. R. Gray adopts Mœhring's generic appellation.

(To be continued.)

## *On a Shark captured in Mount's Bay on June* 11, 1870, *supposed to be identical with the Basking Shark of Pennant and the Broadheaded Gazer of Couch.* By THOMAS CORNISH, Esq.

ON the 11th of June, about half a mile off Penzance pier-head, in less than three fathoms of water, I captured in my trammel a shark nine feet long and of very peculiar appearance. The fish had rolled itself up in the net, and by so doing had tied down its fins and gill-covers, and was consequently enfeebled by partial suffocation when I took it. With some difficulty my boatman succeeded in getting it clear of the net and in slipping a tow-rope over its head, and it was towed on shore uninjured, where I had ample opportunity of examining it alive and in the water, as well as afterwards on shore alive and dead. It was a shark of which I had never seen a specimen before, and of very peculiar appearance. It had a small head, a very remarkable snout, with a beaked projection at the end of it, a very wide mouth, enormous gills, and very great fin power.

The skin of the fish was smooth from head to tail, and rough the other way, but was neither so rough nor so smooth as in most of our English sharks.

The colour of the fish, fins and all (except the snout), was dark dusky blue, a little lighter immediately on the belly, and lighter still under the pectorals, but in no part approaching white. The snout shaded off from the prevailing colour to a dull red, and from that to a dirty white in front just under the beaked projection.

The snout was also covered all over with little marks, as though one had cut the skin half through with a penknife in a great number of places, without attempting to make the incisions in any regular series. Afterwards I ascertained that this punctured skin rested on a strong gristle, within which was a cavity filled with a gelatinous substance. On the under and outer parts of the snout were single-lobed spiracles, and above and behind them and nearer the lower than the upper part of the snout were the eyes, round and not oblong, and gazing laterally and not forward, and having internally the mobile formation usual in the eyes of sharks. Just before the eyes on the top of the head was a protuberance covered by the skin, and just behind the eyes the head proper terminated. The under part of the head was occupied by a very remarkable mouth, the lower jaw of which extended forward to the plane of the eye, and which when open was of a comparative size and capacity, of which I never saw the equal in any shark, or indeed other fish except the angler (*Lophus piscatorius*). In each jaw were three and in some parts four irregular rows of rudimentary teeth, not one of them one-sixteenth of an inch long, and detached from each other. They were inclined inwards, but were so small and blunt that they presented no obstacle to the running of a thumb-nail backwards and forwards over them. There was a smooth tongue not six inches long and semi-detached, and immediately at the root of the tongue was the base of the first gill-ray. The gills themselves, five in number, were the most extraordinary part of the whole fish. The gill-rays and openings extended from the top of the head right round to the throat; the rays were of unusual size and strength. The gills were very large and fleshy, even considering the size of the openings and of the fish, and in front of each, attached by a strong flexible cartilage to the ray, was a slight elastic apparatus extending the whole length of the ray, an inch and a half in depth, and which would be precisely represented by a thin small-toothed comb made of whalebone.* When the mouth was opened during the life of the fish these gill-rays were seen forming part of the sides of it, and behind them was the very capacious swallow, and as the mouth opened the little whalebone combs involuntarily fell back to a right angle with the gill-ray, and effectually barred the egress through the gills of anything except water which might have been taken into the mouth. The interior of the gill-rays and mouth were covered with a soft white substance resembling chamois leather.

The greatest girth of the fish was round the gills, immediately behind which the body fell off to the greatest girth of the body at the pectorals. The body at its greatest girth (and throughout its length) was round, just as broad as it was long, and thence tapered gradually to the tail, becoming somewhat flatter and broader as it approached the fork of the tail. There was no lateral line visible either during the life of the fish or after its death. The pectorals, lying low and close behind the gills, were of large proportionate size. The first dorsal, situated about half-way between the pectorals and the ventrals, was also large, rising thirteen inches above the back in the perpendicular line. About half-way between the pectorals and the fork of the tail were two large ventral fins, but no claspers (the fish was a female); immediately behind them was the vent, and between the ventrals and the tail was a small anal fin, just under and a little behind a small second dorsal. The tail was very large in proportion to the size of the fish, measuring little short of three feet in a straight line from the extremity of the upper to the extremity of the lower lobe. There was no appearance of any keel-like formation at the sides of the body as it approached the tail; but I afterwards found that for some distance from the tail the sides of the body consisted of strong cartilaginous substance, almost as close and hard as the main bones of the fish. There was nothing unusual in the intestinal appearances. There was the short gut usual in sharks and much digested food, but the stomach was empty.

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* Pennant describes something of this sort in his account of the "basking shark." He says "Within the mouth towards the throat is a very short sort of whalebone."

The fish was in excellent condition; the flesh was firm and very white and fat. The skin was thin, and, whilst the fish was alive, very tight-fitting: after the death of the fish it became flabby and loose.

The fish looked like a rapid swimmer, whose large gill-surfaces would invest it with any amount of "slaying" power. The size of the mouth and teeth, and the peculiar pectinated arrangements in the gill-rays, and the intestines, suggested that its food was probably small marine animals of some sort, and that its mode of feeding was analogous to that of the whale.*

The measurements were:

| | Feet. | Inches. |
|---|---|---|
| Over all . . . . . . . . | 9 | 1 |
| Eye to fork . . . . . . . . | 6 | 8 |
| Beaked projection of snout . . . . . . | 0 | 2 |
| Extremity of snout to spiracle . . . . . | 0 | 8 |
| „ eye . . . . . . . . | 0 | 10½ |
| „ origin of pectorals . . . . | 2 | 7 |
| „ „ first dorsal . . . . | 3 | 7½ |
| Length of pectoral . . . . . . . | 1 | 5 |
| Length of the base of the first dorsal . . . . . | 0 | 8 |
| Perpendicular height of first dorsal . . . . . | 1 | 1 |
| Extreme breadth (fore and aft) of first dorsal. . . . . | 9 | 11½ |
| From end of base of first dorsal to origin of second dorsal . | 1 | 7½ |
| Height of second dorsal . . . . . . | 0 | 4 |
| Base of second dorsal . . . . . . . | 0 | 2¼ |
| Extreme breadth (fore and aft) of second dorsal . . | 0 | 5 |
| From base of second dorsal to fork . . . . . | 0 | 10 |
| Upper lobe of tail, consisting of two fins, a large one with a small one near the top . . . . . . . | 2 | 2 |
| Lower lobe . . . . . . . . . | 1 | 4 |
| From origin of pectoral to origin of ventrals . . . . | 2 | 3 |
| Length of ventrals . . . . . . . | 0 | 8 |
| Extreme breadth of ventrals . . . . . . | 0 | 7 |
| Origin of ventrals to origin of anal . . . . . | 1 | 3½ |
| Length of anal . . . . . . . . | 0 | 3½ |
| (Origin of anal a little behind origin of second dorsal). | | |
| Gape across the jaws . . . . . . . | 1 | 0 |

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* Pennant says of the basking shark, "Linnæus says they feed on Medusæ."

| | Feet. | Inches. |
|---|---|---|
| Length from the joint of the jaws to the extremity of the lower jaw in a straight line. | 0 | 7 |
| Width across the beaked projection | 0 | 2 |
| ,, snout behind it | 0 | 5 |
| ,, eyes (the widest part of the head proper) | 0 | 6 |
| ,, the gills | 1 | 2 |
| ,, the body at the origin of caudal | 0 | 5 |
| Girth across gills | 3 | 0 |
| ,, behind pectoral fin, which was the greatest girth of the body | 2 | 7 |
| ,, near tail (where the width was 5 in.) | 1 | 1 |

If I were called upon to distinguish this fish from the "basking shark" of Pennant, I should feel great hesitation in doing so. The only positive distinction to which I could point would be the marked difference in girth as compared with length of the body in the figure given by him, and in my specimen I might perhaps also point to the difference in the conformation of the snout and gills, and negatively I could refer to his omission of all mention of the spiracles and their position. The carinations on either side of the tail, which Pennant notices in his large specimen may be the result of mature years, and represent the ultimate form of the strong gristle which I found in the same place in my specimen; and it is possible that the girth of the figure given by Pennant may be due to the accidental ignorance of the engraver: on the whole, I am inclined to think that Pennant's "basking shark" was probably of the species to which my fish belongs; but if so, then I say that the basking shark of Pennant is not the basking shark of Yarrell and of Couch. The resemblance of my fish to the basking shark, as described by these two naturalists, is in the large size of the gills, the punctuated muzzle, and the number and arrangement of the fins. And no doubt these things point to a similarity in the habits of the two fish, but the points of difference are so numerous, and especially the comparative girth of the body to the length of the whole fish (for I do not admit that in the case of these two recent authors the proportions may be an engraver's error), the size of the teeth,* and situation of the spiracles, that I have very little hesitation in pronouncing that it is not the basking shark of these two authors.

There are two other sharks mentioned by Couch from which my specimen has to be distinguished,—the Rashleigh shark and the broadheaded gazer, for which he formed his genus "Polyprosopus."

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* Pennant says, "Each jaw is furnished with small teeth." Couch says, "The teeth are one inch long."

My fish differs from them in the essential particular that its vision or gaze is not directed forward; but a careful consideration of all the facts inclined me to think that probably this forward outlook was noted in these two sharks by an error of observation. Confessedly Couch never saw either of the two fish he describes: he is careful to state that the account and figure which he had of the gazer came from a person "curious, but scarcely well-informed." He tells us of the Rashleigh shark that he had the figure of it from a gentleman who was a naturalist, but it does not appear that that gentleman saw the fish himself, and the very loose description which was all he could give of it is almost conclusive that the fish was never seen by a naturalist acquainted with fish. Besides which, in the sketch of the fish given there is an utter absence of any attempt to account for a mouth, and a torn and ragged dorsal is accepted as a perfect fin. This absence of attempt to account for a mouth is also a prominent feature in the sketch of the gazer;* and I remarked in my fish that when it had been dead for twenty-four hours, and its gills had lost the elasticity of life, they fell forward in a flabby mass, totally concealing the mouth, and presenting an appearance not unlike the figure of the head of the gazer given by Couch (vol. i. p. 69), only that the eye did not look forward and the gill-openings were on and not behind the broad part behind the snout.

Considering these things and the unwieldy size of the two fish figured by Couch, one twenty-nine feet four inches long and the other over sixteen feet, it seems to me more probable that unskilful observers should be mistaken than that two sharks should wholly depart from the shark type of eye.

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* This refers to the figure given in the body of the work (vol. i.). In the Appendix to Couch's Fishes is given another, and much more accurate, figure of the same fish; but the shapes of the fins are doubtless peculiar, and on comparing them with the letter-press they will be found not to scale. A better description of the same fish is to be found in the Transactions of the Penzance Natural History and Antiquarian Society for 1854, in a paper by the same Mr. Couch, "On two Species of Sharks believed to have been confounded together under the name of 'The Basking Shark'" (p. 234). In this he mentions the small ray-like teeth of the gazer, and, noticing the difference in bulk between it and the Rashleigh shark, supposes the former may have been an emaciated specimen of the latter, and that its sick condition may have accounted for its presence in shallow water, saying, "There can be no doubt that its usual residence is at the bottom, and that, too, in very deep water Couch also says in this article, "The summit of the head was much wider than the body above the gill-openings;" and he thinks this another sign that the fish was emaciated. Owing to his not having seen the specimen he was led into an error about the size of the head, but this description of the bulk of the body at the gill-covers precisely agrees with the observed shape of my fish.

Couch's figure of the broadheaded gazer, from the gills inclusive to the tail, precisely agrees with my fish, and but for the observed girth of the Rashleigh shark I should be much inclined to say they are all three of the same species of fish; but, as the facts stand, I for myself am inclined to think that the Rashleigh shark was a basking shark of Couch and Yarrell (which species itself has apparently never been observed with sufficient care to establish the shape and position of its mouth), and that Pennant's basking shark, the broadheaded gazer and my fish are sharks having affinities to the basking shark, but sufficient specific differences to establish them as distinct: and if I were called upon to describe my fish by the peculiarity which first struck observers I should call it the "snouted shark" (say Squalus rostratus or Cetorhinus rostratus).

On the inner side of the pectorals and on each side of the fork of the tail were colonies of the ordinary shark parasite.

The skin of the fish has been successfully set up for the Natural History Museum at Penzance.

In the very same coil of the net which enclosed the shark I took two other fish which would have been well worth a separate notice under any circumstances. They were two specimens of the black fish (*Centrolophus pompilus*, Cuvier). They were meshed in the net, and had evidently struggled severely before they were tied up tightly in the roll of net made by their gigantic fellow-prisoner. At first I thought they might have been swallowed by the shark and ejected in his struggles; but the fact of their being meshed was against this, and on careful search afterwards I found them quite fresh and free from any trace of digestive action. Recollecting the habits of the pilot fish, and that the Pompilus is allied to it, it is curious to observe the presence of these two in company with a strange shark, but further observation alone can show whether their simultaneous presence and capture in our waters was a mere coincidence, or whether the black fish were in company with the shark. It is to be remarked that the solution of this question will probably have a most important bearing on the question of the identity or otherwise of my shark with the basking shark of Pennant. The black fish is a southern fish, the basking shark is a northern fish, and if the black fish were the companions of my shark it probably came from the south and not from the north. The larger of the two specimens of C. pompilus was a little over eighteen inches long.

THOMAS CORNISH.

Penzance, July 21, 1870.

*Sun Fish on the Dorsetshire Coast.*—A very fine specimen of this monster of the deep was captured in the bay on Thursday afternoon last. Mr. W. Anderson, of Bread-street, London, who had been staying in the town for a short time, was cruising in a little yacht during the afternoon, and suddenly espied this strange object lying on the surface of the water, basking in the sunshine. On perceiving a movement, having a gun with him, he discharged the contents of a couple of barrels, which lodged in the side of the head. Plunging suddenly down and almost as quickly rising to the surface, the opportunity of capturing had eagerly to be watched. Another shot had to be fired, which seemed to hit some vital part, and a noose was quickly fastened at the back of the fins, and the huge thing with some difficulty brought ashore at Cobb-gate. It measured five feet six inches long and six feet four inches deep, measuring from the extremities of the large fins, and is supposed to weigh from six to seven cwt.—*Alwin S. Bell; 4, Royal Terrace, Weymouth, July* 22, 1870.

*Sun Fish at Abbotsbury.*—An extremely fine specimen of the short sun fish (*Orthagoriscus Mola*) was taken in a seine at Abbotsbury on Wednesday. The weight was estimated at not far short of a ton. The length was about five feet, and the breadth nearly the same. The fish was bought by Mr. Vincent and taken to Weymouth for exhibition. Probably the continued calmness of the weather had caused the appearance of this creature on our coast, from the warmer latitudes (Mediterranean, &c.), which it usually inhabits. The fish was placed in the marquee in the new gardens at Weymouth, and exhibited at twopence each visitor. Large numbers of the Medusæ, or common jelly-fish, about the size of a parasol, have also entered Weymouth harbour during several days.—*Id.*

*Black Variety of Montagu's Harrier in North Devon.*—Mr. Shopland, bird-preserver, of Torquay, showed me to-day a very beautiful adult pair of the dark race of Montagu's harrier, which were sent to him from North Devon, on the 7th of May, to be stuffed, and informed me that he found in the stomach of the male six young partridges, and the remains of some sky lark's eggs and of three or four sand lizards: the stomach of the female harrier also contained the remains of several sand lizards, together with those of a slow-worm and a field mouse.—*J. H. Gurney; Marldon, Totnes, July* 16, 1807.

[The three following notices respecting this interesting variety are extracted from the 'Field' newspaper.—*E. Newman.*]

*Black Montagu's Harrier.*—I had brought to me last Monday, the 20th of June, a most peculiar-marked specimen of Montagu's harrier. It was a male bird, and of a uniform black-blue colour. On dissection, I found in its crop six young sky larks, and in its stomach three more, and five sky lark's eggs; three were broken in two, and one had a small hole in it, evidently made by the harrier's beak; the other, which I have blown, is quite perfect. Is it usual for the harriers to swallow the eggs whole, without tapping them? The eggs were in the stomach, not the crop.—*B. Bates; Eastbourne.*

*Black Montagu's Harriers.*—A black variety of Montagu's harrier would seem to be not uncommon in Africa and Southern Europe, but does not appear to have been observed anywhere in Asia, where the species is more or less abundant. Mr. Howard Saunders mentions obtaining "two very black males of Circus cineraceus" near Seville ('Ibis,' 1869, p. 400). There is a very fine black male of this species, having a roseate gloss upon its upper parts, in the Canterbury Museum, shot near that city; and in the Dover Museum I observed another, and was told by the conservator there that he had seen five or six like it in the course of his experience. I am unaware that a similar melanous variety has been observed of either of the gray harriers, C. cyaneus and C. Sykesi. All three are common in India, but the second only in its northern provinces.—*Field.*

*Black Montagu's Harriers.*—With reference to the black Montagu's harriers, I find that Mr. E. L. Layard, in his work entitled 'The Birds of South Africa' (p. 35), introduces and describes a Circus maurus, *Temminck* (C. ater, *Gray*, nec *Vieillot*), but mentions that "by some writers this species is thought to be a black variety of C. cineraceus," which to my apprehension is undoubtedly the case. He states that "This very handsome harrier is not at all uncommon in the neighbourhood of Cape Town, and is generally seen in pairs, beating the bushes for prey, and quartering the ground with the regularity of a pointer dog;" but he does not mention any diversity in the plumage of the sexes or of the young. "After a few heavy flaps with its wings," he adds, "it sails along with its pinions elevated, swaying to and fro like a clock-pendulum; suddenly it checks itself, lets fall a leg, clutches up a cowering lark or unsuspecting jerboa" (gerbelle rat?), "and flies away with it to the nearest termite heap, on which it perches and commences its repast. If accompanied by its mate, a shrill stridulous cry soon brings it to its side, and the dainty morsel is shared between them. It breeds among reeds, making a thick heavy nest on any elevated root that may lift it above the water. The eggs are said to be white." The ash-coloured C. cineraceus is asserted by Mr. Layard to be rare in South Africa. Another well-qualified observer, who is familiar with the Ornithology of the South of Spain, assures me that C. cineraceus is there the commonest of the three gray harriers, and that black individuals of it are by no means infrequent. It is remarkable, therefore, that the latter do not appear to have been observed anywhere in Asia, where the species is widely distributed.—*Id.*

*On the Southern range of the European Merlin.*—Dr. Jerdon, in his work on the 'Birds of India' (vol. i. p. 35), includes the merlin (*Hypotriorchis Æsalon*), and thus refers to its range in India:—"The merlin appears a very rare visitant to the extreme north-west frontier of India, during the cold season only. Dr. Adams observed it in the north-west of the Punjab. Mr. Blyth, in his Catalogue, gives the north-west Himalayas with a query." The Punjab is about the same latitude as Lower Egypt, and, though giving the merlin a great easterly range, bears out Mr. Gurney's opinion in the 'Zoologist' (S. S. 2221) as to its southern limit.—*H. W. Feilden; Chester Castle.*

*Brunnich's Guillemot.*—Is there any record of the occurrence of this species at the Farne Islands? I have an egg, taken there in June, so exactly resembling the figure given in Hewitson's 'Illustrations of British Birds' Eggs,' that I think it must have been laid by a bird of this species. Out of several dozens I can find no other like it in form, which is "more like eggs of the razorbill." As I did not see the bird, I can give no opinion upon that point. In Mr. Hewitson's description of this egg is this passage, on the faith of Mr. Hancock, "However white the ground-colour may appear to be, the shell of the eggs, upon holding them to the light, is *always dyed with greenish blue*, which is not the case with eggs of the common guillemot, the ground-colour of which is often tinted with yellow." I should like to know the experience of collectors upon this point. So far as my limited experience goes, there seems no reliance to be placed upon it, even approximately. I find that eggs of the common guillemot *apparently* quite free from any green or blue tint are *generally* a dirty or yellowish white when held up to the light, whilst eggs with any apparent tinge of blue or green are these colours when looked through: of course the shadings of colour vary so much that it is often necessary to examine very closely and discriminate very nicely as to the presence of blue or green, but the above seems to me to be a rule with the eggs of the *common* guillemot.—*T. W. Gissing; Wakefield, July* 18, 1870.

*Increase of Rock Birds at Flamborough.*—I am happy to say that there is a marked increase in the number of sea-fowl breeding this year at Flamborough and the adjoining cliffs. On the 20th of June I visited Speeton and Bempton cliffs, and accompanied the egg-climbers in their round. Old Aaron, the cragsman, who has been climbing for thirty-eight seasons in succession, assured me that there were a greater number of fowl on the cliffs this year than he had seen for ten or twelve years, though nothing to equal what there was when he was a boy. On the 22nd I took a boat from Flamborough, and went along the cliffs: the fishermen in the boat also noticed the great increase of the birds this season, and pointed out places tenanted by fowl which have been vacant for ten years prior. This speaks well for the Sea-fowl Preservation Act.—*H. W. Feilden.*

*Dwarfs.*—To the north of Mani Kesock (King Kesock) are a kind of little people called Matambas, who are no bigger than boys twelve years old, but very thick: they live only upon flesh, which they kill in the woods with their bows and darts: they bring in elephants' teeth and tails. If any stranger pass their dwelling they immediately remove. They kill the pongos with poisoned arrows. Here we have Du Chaillu's dwarf gipsies much about where they should be, dealing in elephants' teeth and tails. The tales of Andrew Battel puzzled me till I turned to Du Chaillu, and found that elephants' tails were a great fetish.—*Kingsley's 'Tales of Old Travel'* (p. 76.)

## Proceedings of the Entomological Society.

### *Note to June Meeting.*

Since the Meeting, the following notes have been furnished by Major Munn:—

"At a recent Meeting at Nüremberg, the bee-masters talked of the life of the queen-bee as extending to four and five years, and I am not sure that some works on bee-management have not given even seven years. My own observations confirm the Report made to this Society on the duration of life in the queen, drone, and worker of the honey-bee, by Mr. J. G. Desbrough, who has given some excellent calculations and facts; and the following results have been arrived at since the introduction into this country of the Ligurian bee. In October, having got together two swarms of the brown bee, the queen was removed, and a Ligurian yellow queen was introduced; she remained, and raised the stock in May, when every bee was a true Ligurian. Again, this Ligurian stock being strengthened in October with other Ligurian workers, a brown queen was introduced from another apiary; in May, every bee was found to be of the true home-bred brown form. This settled the question of the age of the workers, taking the winter half of the bee-season. Having raised and saved a hive filled with drones, and allowing them to exist in the stock by destroying the impregnated queen and by keeping the bees employed in attempting to raise queens, October found the drones hatched and located in the hive; but to prevent their slaughter, the queen was removed, when the drones lived, and perished almost the last in the stock in the month of January. With regard to the queen, the exhaustion of the two ovaries constitutes in my opinion the life of the queen, which would only extend to the second season of egg-laying, provided the queen were left in her normal condition, free to go and come into her hive, in a mild and equable climate, and amidst an abundant harvest of honey and pollen for the workers to collect and feed the larvæ.

"I turn now to the question, How are the larvæ fed, and wherein is the feeding different for the queen-bee? Take the worker first in order: the egg, having been attached on one of the rhombs at the base of the hexagonal cell, hatches after three days, and even six or longer, according to the season; the small white maggot exhibits no trace of external organs or members, but on closer examination by the lens, shows a very imperfect oral apparatus or mouth, for the reception of food as has been commonly stated by all writers; through this imperfect apparatus the workers are supposed to feed the larvæ. Prof. Westwood informs me the mouth is quite perfect when the larva is full-grown, and on the lower lip a pair of spinnerets may be found, with which it spins its cocoon preparatory to becoming a pupa. Moreover there is no anal orifice, as no food passes through the stomach until just before the final change to the pupa. Why then should not the first stage of the larval existence be maintained and increased by endosmosis or absorption? The larvæ are not fed whilst in the cells, but are constantly lubricated with honey and water; the larva has no motion, nor can any impulse be given it by the application of turpentine or the prick of a needle; it is simply a sack, with markings of a mouth, with the body divided into thirteen or fourteen rings, along the sides of which may be seen the ten spiracles or breathing holes, or perhaps in this stage glands as well, to convey more perfectly the nourishment, and form the ganglia of the perfect bee.

The changes in internal structure are rapid; one day you find a mere integument, filled with corpuscles of white creamy-looking flakes—which on chemical analysis I find to be grape-sugar and water, the very material with which the nurse-bees lubricate the larvæ (this however in the queen-cell forms a strong pulpy bed, upon which the larva rests, but of which the worker and drone cells contain none, whilst in the queen cell the jelly occupies nearly a third of the cell, making it as it were a hot-bed around the queen larva)—a third day will show the œsophagus commenced and the silk-forming glands also formed on either side, and thus ready on the fifth day to be used through the spinnerets to spin its cocoon—an act which is a marvel to me. I have discovered that the bees do not form the silken respirator as has been hitherto stated, nor do they hermetically seal up the cell, but leave the larva to finish the silken respirator, and merely cover the sides and angles of the cells so as to strengthen them, and make them fit to pass over, like stepping-stones over the heads of the pupa, now resting to pass into the perfect or imago state. This the worker accomplishes in twenty days, the drone in twenty-four, and the queen in sixteen, subject to variations of weather, but as an average correct.

"I have much to state of the impregnation of the queen-bee and against the parthenogenesis theory of the present day, or the power of the queen to leave her eggs unfertilized so as to produce either workers or drones. I believe the female is the early impregnation, and the male the later impregnation, as found in fact amongst animals as a rule, especially in cattle; the last of a series of ova become drones, and the earlier the workers. The eggs all have to pass through the common oviduct, and thus pass the mouth of the spermatotheca: now whilst there is no doubt there are muscles, as Siebold has proved by dissection, to extrude or restrain the eggs, these voluntary muscles have to be guided. Siebold and Dzierzon say that instinct will tell the queen when to exercise her judgment truly: at the moment when she pushes her abdomen into a wide drone cell or the narrow cell of the worker, the distinction of the wider and narrower cells will certainly be felt out by a normal queen with her abdomen; (but here let me remark this queen's abdomen, if about to lay her last series or drone eggs, is larger and heavier than in her first laying workers' eggs in the spring); but, says Siebold, she well knows by the sensation of the touch that she must fertilize the eggs to be deposited in a narrow cell, whilst she has to lay the egg without fecundation in a wide cell. But it is a fact that eggs are laid constantly in unfinished workers' cells, and extruded as well into drone cells, two or three eggs in a cell, when the queen has by some cause been driven to delay laying after impregnation. But the fecundated egg being required for the queen-bee, Dzierzon and Siebold have to find another reason, and they add that 'by the peculiar texture of an incomplete royal cell too, a normal queen will be instinctively induced to fertilize the egg to be deposited in it.' I believe Prof. Owen has been misquoted by Siebold and Dzierzon; and I feel assured that the latter has also accidentally misdirected Siebold that the eggs of queens "are only of one of the same kind, which when they are laid without coming into contact with the male semen become male bees, but, on the contrary, when they are fertilized by male semen produce female bees." I must leave the matter at this point; although I have ample evidence to prove the impregnation of the 'fertile workers' as well as the normal queens, and to show how mistake has crept into the microscopic dissections of the eggs, when every egg must be fertilized in passing the spermatotheca, especially if the eggs be all of one size, as has been stated by Dzierzon; but the entrance of the spermatozoa is at the base of the egg (the future mouth of the larva), and absorption introduces the semen into the egg, as I shall be prepared to show on another occasion.

"Briefly, my facts are these. A fertile impregnated queen lays eggs, female and male in succession: these are all necessarily fertilized as they descend through the common oviduct whilst passing the spermatotheca; and each spermatozoön, adhering to the base of the egg, and agglutinated to the cell by the queen, in due time enters the egg, the chorion is broken, and the larva is seen when the small transparent sack is floated in the sugar and water: here I believe the endosmosis process takes place; as to the development of the larva the first process is the completion of the silk glands, then the main canal seems to be formed more distinctly, the anal passage never being opened until the larva is fully filled, if I may so term it, or the growth of the larva accomplished, when the spinnerets come into use, and the larva having discharged a small deposit in one corner of the wax cell (which black or brown substance may be seen in cells newly occupied for breeding), the spinning from the foundation commences, and finally the larva, finishing the silken respirator at the top, is found with its head upwards, and in due time gnawing its way out at the top, emerges either as a drone or worker from the confined cells, whilst the occupants of the large cells, with the larger supply of jelly and a more rapid absorption of sugar and water or honey and water, emerge as the perfect queens. When the bees raise 'fertile workers,' these never have jelly given them, and are fed up at a later period of their larval stage, and have neither space nor time for expansion."

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*July* 4, 1870.—A. R. WALLACE, Esq., President, in the chair.

### *Additions to the Library.*

The following donations were announced, and thanks voted to the donors:—'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1869, Nos. 1—3; presented by the Society. 'Bulletins de l'Academie Royale des Sciences de Belgique,' 2d series, vols. xxvii., xxviii.; by the Society. 'Verhandlungen der k. k. zool.-bot. Gesellschaft in Wien,' vol. xix.; by the Society.

'Mittheilungen der Schweizerischen entomologischen Gesellschaft,' vol. iii. No. 4; by the Society. 'Exotic Butterflies,' Part 75; by W. Wilson Saunders, Esq. 'Lepidoptera Exotica,' Part 5; by E. W. Janson, Esq.

The following additions by purchase were also announced:—Gemminger and Harold, 'Catalogus Coleopterorum,' vol. vii. Thorell, 'Remarks on Synonyms of European Spiders,' No. 1.

### *Election of Members.*

The Rev. F. A. Walker, M.A, of Elm Hall, Wanstead; and Edward Mackenzie Seaton, Esq., of 28, Belsize Park; were severally ballotted for, and elected Members.

### *Exhibitions, &c.*

Mr. E. G. Meek exhibited various species of Dianthœcia, including D. Barrettii, D. compta and D. conspersa from Ireland, and D. conspersa from the Isle of Man. Also a remarkable Bombyx from near Douglas, Isle of Man; which was considered by Mr. Stainton to be a dark variety of Glyphisia crenata.

The Hon. T. De Grey exhibited a series of Oxyptilus lætus (Zeller), from Brandon, Suffolk.

Mr. M'Lachlan, on behalf of Mr. Tegetmeier, exhibited some nature-printed butterflies, the bodies and antennæ being painted by hand: they were so admirably executed as to have been taken for lithographs, and were offered for sale as such by an eminent firm.

Mr. Blackmore exhibited a number of insects, chiefly Lepidoptera and Coleoptera, the result of last winter's collecting in Tangier. Among the butterflies was a fine series of the true Anthocharis Euphæno (Linn. sp.), a species till recently mistaken. Among the Coleoptera was a curious monstrosity of Pimelia scabrosa; the right-hand antenna was doubly furcate, or rather there were two antennæ, of which the two basal joints were united; branching from the third joint, the right hand fork was of normal form, but the left hand fork was again furcate, a small two-jointed limb springing out (at the top, not at the side) of the 8th joint of the fork (*i. e.* the 10th joint of the antenna).

Mr. F. Moore exhibited cocoons of a Sagra from Bombay, collected by Mr. Newton; three cocoons with the beetles which had emerged therefrom were shown *in situ*, and lay contiguous within a large swelling in the stem of a creeper (Cocculus macrocarpus).

The President read the following extract from a letter, dated "Sarawak, 17th April, 1870," from Mr. A. Everett;—

"My brother has found two remarkable spiders. One, which we had not the means of keeping at the time, was lying with its legs pressed closely beside its body, and was white streaked with black in irregular fashion: when he called me to see it, I looked closely but in vain for it, the only thing visible on the leaf being apparently a patch of bird's dung; when it moved, one saw immediately what it was. The other is similar in colour and behaviour, but seems to belong to a different genus, and the resemblance to the droppings of a bird is not so completely deceptive. These would appear to be instances of protective mimicry, and as such will perhaps be of interest to you. I have another example, almost if not quite as evident: I had a caterpillar brought me, which, being mixed by my boy with some other things, I took to be a bit of moss with two exquisite pinky-white seed-capsules; but I soon saw that it moved, and examining it more closely found out its real character: it is covered with hair, with two little pink spots on the upper surface, the general hue being more green: its motions are very slow, and when eating, the head is withdrawn beneath a mobile fleshy hood, so that the action of feeding does not produce any movement externally; the shape is oval, and the edges are fringed with tufts of hair: it was found in the limestone hills at Busan, the situation of all others where mosses are most plentiful and delicate, and where they partially clothe most of the protruding masses of rock; I placed it in spirit, but it has become shrunken and turned to a dirty yellowish colour. Such things, however, require to be seen alive in order to properly appreciate the close resemblance they bear to the particular objects they resemble."

Mr. De Grey mentioned that he had often been struck by the resemblance of the caterpillar of Melitæa Cinxia to the flower of the plantain upon which it feeds, whilst the pupa resembled the seed of the same plant.

Mr. Albert Müller exhibited some galls on Ammophila arundinacea, found last autumn by Mr. J. Traill about two miles north of Aberdeen; they occurred rather abundantly on stunted specimens, one gall on each plant. The gall consisted of the imbricate closely-sheathed leaves of a top-shoot, which contained a single longitudinal narrow cell, from two to three lines long, the upper part of which was pierced by the escaping insect. The insect, however, had not yet been detected.

The Secretary exhibited a large woolly gall of the oak and a number of living specimens of Cynips ramuli which had emerged therefrom. The gall was found on the 24th of June, at Idsworth, near Horndean, by Sir J. Clarke Jervoise, Bart., who wrote respecting it as follows:—

"My attention was yesterday called to what I thought was a ball of sheeps' wool in a meadow where there were no sheep, and I placed it under a glass clock-shade for security. This morning I found the clock had stopped, and a quantity of flies were in the case and in the works of the clock. I never happened to have seen a similar growth on the oak, a sprig of which is visible in the woolly gall, and I have sent some of the flies in spirits. There are more hatched out in the box since I placed the oak-gall in it." How many specimens of the Cynips hatched in the clock-case did not appear, but the box exhibited was found to contain upwards of eighty.

Prof. Westwood made some observations on a very minute form of Acaridæ, to which he had already directed the attention of the Society (see Proc. Ent. Soc. 1864, p. 30); they were about $\frac{1}{200}$ of an inch in length, found in the unopened buds of the black currant, the blossom of which they destroyed; they were elongate, cylindrical and fleshy, and possessed only four legs. A somewhat similar form found in galls was some years ago described in France; and the Rev. M. J. Berkeley had recently called Prof. Westwood's attention to a third form which attacks pear trees, and makes small patches or pustules on the leaves. At Oxford he had found many of these blotches, and as many as thirty or forty Acari in a single blotch; in some cases there was a small opening in the leaf, but in the majority there was no visible aperture; perhaps the parent when depositing her eggs makes a small hole which afterwards closes over. Notwithstanding the existence of only two pairs of legs, he thought these were a mature form; and the three species seemed to constitute a distinct four-footed tribe in the family Acaridæ, distinguished likewise by having the whole surface covered with minute tubercles (like the parasite of the human nose) arranged in as many as sixty transverse rows; at any rate they required to be segregated under a separate generic name, and he proposed that of Acarellus, the three species being Acarellus pyri, A. ribis-nigri, and A. gallarum.

Mr. Albert Müller suggested that these forms perhaps belonged to the already-named genus Phytoptus or Phytopus, the species of which inhabit excrescences of various plants, had at one stage of their existence only four legs, and are closely allied to Simonea folliculorum. He referred to papers by Frauenfeld in Verh. zool.-botan. Ges. Wien., vol. xv. (1865), and Landois in Zeitsch. f. wiss. Zool., vol. xiv. (1866).

### *Papers read.*

The following papers were read:—

"Further Observations on the Relation between the Colour and the Edibility of Lepidoptera and their Larvæ"; by Mr. J. Jenner Weir.

"List of Species in a Collection of Butterflies sent by Mr. Henry Ansell from Kinsembo, South Western Africa"; by Mr. A. G. Butler.

"Contributions to an Insect-Fauna of the Amazon Valley" (Coleoptera, Cerambycidæ); by Mr. H. W. Bates.

"List of the Hymenoptera collected by Mr. J. K. Lord in Egypt and Arabia; with Descriptions of the New Species"; by Mr. Francis Walker.

### *New Part of 'Transactions.'*

The second Part of the 'Transactions for the year 1870," published in June, was on the Table.—*J. W. D.*

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